

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/828,530 Confirmation No. 4322

Applicant : Laszlo J. Kecskes et al.

Filed : April 6, 2004

TC/AU : 1742

Examiner : George P. Wyszomierski

Docket No. : ARL 03-60

Customer No. : 37064

Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.132

I, Laszlo J. Kecskes, having been advised of the penalties for perjury under 18 U.S.C. § 1001, state as follows:

1. I was awarded a Ph.D. in 1996 in Materials Science and Engineering by the University of Delaware.

2. I was awarded a M.S. in Physics by the University of Minnesota in 1985 & a B.S. in Physics in 1981 by Rensselaer Polytechnic Institute.

3. I have been employed by the U.S. Army Research Laboratory, Weapons and Materials Research Directorate, Ordnance Materials Team located at the Aberdeen Proving Ground Maryland since February 1985. I was Acting Team Leader of the Ordnance Materials Team from February 2005 to September 2006.

4. I have numerous publications and presentations such as the following:

Refereed Journal Papers: Single Author: 4; Primary Author: 15; Contributing Author: 12

Symposium Publications: Single Author: 5; Primary Author: 15; Contributing Author: 34

Government Documents: Single Author: 4; Primary Author: 10; Contributing Author: 9

Other Publications: Single Author: 2; Primary Author: 2; Contributing Author: 3

Invited Presentations to/Invited Appearances before Professional Groups: 4
Professional Societies, Associations, and Universities: 59

Other Presentations (within DOD): 63

5. I have read the Office Action mailed 22 February 2007 and understand the Examiner to be saying that Wolter shows hafnium and zirconium are expected to be equivalent of each other and the disclosure of one makes one of ordinary skill in this art expect the other to act in the same way.

6. All the specific examples and the work reported in Figure 1 of the current application were done by me or under my direction and control.

7. Despite the high degree of similarity between Hafnium (Hf) and Zirconium (Zr), the direct substitution of Hf for Zr into Zr-based Metallic glass alloys (MGAs) results in a significant degradation of the glass-forming ability of the material. It has been discovered that although Zr-based MGA may be a eutectic or near-eutectic composition, the equivalent Hf-based MGA is not. Such a special composition melts congruently, with a sharp endothermic peak in its differential thermal analysis trace. That is, it behaves as a single-phase solid transforming into a liquid at one temperature. In contrast, an off-eutectic composition exhibits a wide endothermic peak. Figure 1 of the subject application illustrates the incongruent melting behavior of the Hf-based equivalent of a Zr-based MGA, $\text{Hf}_{52.5}\text{Cu}_{17.9}\text{Ni}_{14.6}\text{Ti}_5\text{Al}_{10}$. The arrow indicates the trailing end of the melting peak, implying the presence of a phase that does not melt until higher temperatures. Consequently, it was necessary to determine the precise position of this special composition point in the Hf-Cu-Ni ternary system.

8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



Laszlo J. Kecskes, Ph.D.